

WHAT IS CLAIMED IS:

1. A process for the cosmetic treatment of hair, comprising:

- a) producing activated hair by non-reducing activation of the hair; and
- b) applying to the activated hair at least one cosmetically active compound comprising at least one functional group capable of forming at least one covalent bond with the activated hair.

2. The process according to claim 1, wherein the at least one functional group of the cosmetically active compound comprises at least one electrophilic center.

3. The process according to claim 1, wherein the at least one functional group of the cosmetically active compound is chosen from the following functional groups:

- epoxides;
- aziridines;
- vinyls and activated vinyls, derived from acrylonitrile compounds, acrylic esters, methacrylic esters, crotonic acids, crotonic esters, cinnamic acids, cinnamic esters, styrene and its derivatives, butadiene, vinyl ethers, vinyl ketones, and maleic esters;
- carboxylic acids;
- acetals;
- hemiacetals,
- disulphides;
- aminals
- hemiaminals;
- cyclic carbonates;
- lactones;
- thiolactones;

- azlactones;
- thioethers;
- thiocyanates;
- imines;
- succinimides;
- glutimides;
- oxazines;
- oxazolines;
- ketones;
- oxaziniums;
- oxazoliniums;
- aldehydes;
- functional groups of the formula $-RX$, in which R is chosen from alkyl radicals, aryl radicals, and aralkyl radicals and X is chosen from I, Br, and Cl;
- $-OSO_3R'$ in which R' is chosen from a hydrogen atom and from alkyl radicals;
- $-OSO_2R''$ in which R'' is chosen from a hydrogen atom, from alkyl radicals, and from aryl radicals;
- $-N^+(R''')_3$ in which R''' is chosen from alkyl radicals and aryl radicals;
- $-OPO(OR''')_2$ in which R''' is chosen from a hydrogen atom and from alkyl radicals;
- halide functional groups of at least one unsaturated ring; and
- functional groups of the formula $-SO_2X'$, in which X' is chosen from F and Cl.

4. The process according to claim 3, wherein the at least one unsaturated ring is chosen from carbon-based rings and heterocycles of the formula -R¹""X", wherein R¹"" is chosen from unsaturated carboxylic radicals and unsaturated heterocyclic radicals and X" is chosen from I, Br, and Cl.

5. The process according to claim 1, wherein the non-reducing activation of hair is chosen from at least one of physical activation and chemical activation.

6. The process according to claim 5, wherein the non-reducing activation of hair is physical activation.

7. The process according to claim 6, wherein the physical activation comprises subjecting the hair to at least one of heat, electromagnetic waves, electric fields, acoustic waves, and plasmas.

8. The process according to claim 5, wherein the non-reducing activation of hair is chemical activation.

9. The process according to claim 8, wherein the chemical activation comprises applying to the hair at least one compound capable of non-reducing activation of hair.

10. The process according to claim 1, wherein the formation of the at least one covalent bond between the cosmetically active compound and the activated hair is obtained after at least one reaction chosen from a nucleophilic substitution reactions, an electrophilic substitution reaction, a free-radical substitution reaction, an addition reaction to carbon-carbon or carbon-hetero atom double bonds, an addition reaction to carbon-carbon or carbon-hetero atom triple bonds, and a ring-opening reaction.

11. The process according to claim 1, wherein the formation of the at least one covalent bond takes place spontaneously.

12. The process according to claim 1, wherein the formation of the at least one covalent bond takes place by activation through at least one of temperature, pH, coreagents, and chemical catalysts.

13. The process according to claim 1, wherein the cosmetically active compound is chosen from simple molecules, polymers having only one functional group capable of forming a covalent bond with the activated hair, particles, and vesicles.

14. The process according to claim 13, wherein the cosmetically active compound is chosen from dye derivatives, sunscreens, vitamins, peptides, saccharide, moisturizing agents, refreshing agents, and agents known for beneficial properties on hair.

15. The process according to claim 13, wherein the cosmetically active compound comprises at least one polymer synthesized via at least one reaction chosen from a free-radical reaction, a condensation reaction, and a ring-opening reaction.

16. The process according to claim 15, wherein the at least one polymer synthesized via at least one free-radical reaction is chosen from polyacrylates, polymethacrylates, and polyvinyls.

17. The process according to claim 15, wherein the at least one polymer synthesized via at least one condensation reaction is chosen from polyesters, polyethers, polyamides, polyurethanes, polydimethylsiloxane, and polypeptides.

18. The process according to claim 15, wherein the at least one polymer synthesized via at least one ring-opening reaction is chosen from polyalkyleneimines and polyesters.

19. The process according to claim 13, wherein the polymers are chosen from polymers of natural origin and are optionally chemically modified.

20. The process according to claim 19, wherein the polymers are chosen from cellulose, dextran, chitosan, guar, hydroxyalkyl derivatives thereof, carboxymethyl derivatives thereof, amino derivatives thereof, thiol derivatives thereof, and derivatives thereof containing at least one of aldehyde and epoxy functional groups.

21. The process according to Claim 13, wherein the polymers are in linear, branched, starburst, or hyperbranched form.

22. The process according to claim 9, wherein the compound capable of non-reducing activation of hair is capable of binding to the hair by at least one of hydrogen bonding and adsorption.

23. The process according to claim 9, wherein the compound capable of non-reducing activation of hair is chosen from oxidizing agents, non-reducing polymers, acids, bases, non-reducing salts, and amphiphilic compounds.

24. The process according to claim 23, wherein the oxidizing agent is chosen from aqueous hydrogen peroxide solution, bromates, and persalts.

25. The process according to claim 23, wherein the non-reducing polymers are chosen from polyamines, polyamides, (meth)acrylic acid homopolymers, and (meth)acrylic acid copolymers.

26. The process according to claim 23, wherein the acid is chosen from hydrochloric acid, citric acid, and tartaric acid.

27. The process according to claim 23, wherein the base is chosen from sodium hydroxide, aqueous ammonia, and alkanolamines.

28. The process according to claim 23, wherein the non-reducing salt is sodium chloride.

29. The process according to claim 23, wherein the amphiphilic compounds are chosen from anionic, non-ionic, amphoteric, and cationic surfactants.

30. The process according to claim 9, wherein the compound capable of non-reducing activation of hair is chosen from polyalkyleneimines and derivatives thereof, polyalkylamines, polylysines, polyallylamines, polyglutamines, hyperbranched polymers, dendrimers comprising amine end groups and derivatives thereof, natural polysaccharides, modified polysaccharides, proteins comprising at least one amine functional group, proteins comprising at least one hydroxyl functional group, hydrolysates and derivatives thereof, particles that are insoluble but dispersible in a cosmetically acceptable medium and whose surface comprises at least one reactive function, and vesicles.

31. The process according to claim 30, wherein the vesicles are chosen from molecular micelles and polymeric micelles.

32. The process according to claim 9, wherein the compound capable of non-reducing activation of hair is chosen from:

- dendrimers whose chain ends are primary amines;
- dendrimers comprising at least one hydroxyl functional group;
- hyperbranched polymers comprising at least one hydroxyl functional group;
- polyethyleneimines;
- polylysines;
- hydroxypropyl cellulose;
- aminodextran;
- polyvinyl alcohols;
- polyvinyl amino alcohols;
- chitosan;

- carboxymethyldextran; and
- carboxymethylchitosan.

33. A process for the cosmetic treatment of hair, comprising:

- a) producing activated hair by treating the hair using a physical activation process for a time sufficient to activate the hair, optionally under heat; and
- b) after optionally rinsing, applying to the activated hair for a leave-in time ranging from 1 to 60 minutes at least one cosmetically active compound capable of forming at least one covalent bond with the activated hair.

34. The process according to claim 33, wherein said time sufficient to activate the hair is a leave-in time ranging from 1 to 60 minutes.

35. A process for the cosmetic treatment of hair, comprising:

- a) producing activated hair by applying to the hair for a leave-in time ranging from 1 to 60 minutes at least one compound capable of non-reducing activation of the hair, optionally under heat; and
- b) after optionally rinsing, applying to the activated hair for a leave-in time ranging from 1 to 60 minutes at least one cosmetically active compound capable of forming at least one covalent bond with the activated hair.